

WHAT IS CLAIMED IS:

- 2 1. A device for dispensing and analyzing uniform samples of liquid
comprising:
- 4 (a) a sample well for receiving a portion of said liquid;
 (b) a capillary passageway communicating with said sample well of (a) for
6 receiving said liquid from said sample well by capillary action, said passageway
including a segment defining the volume of said uniform liquid sample, said segment
8 being disposed between two intersecting passageways vented to the atmosphere, said
segment communicating with a transfer capillary passageway for transferring said
10 uniform sample from said segment to a first reagent well; and
- 12 (c) a capillary stop disposed within said transfer passageway for preventing
transfer of said uniform sample to said first reagent well.
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- 16 2. A device of Claim 1 wherein the capillary passageway of (b) has walls for
contacting said sample liquid which are hydrophilic relative to said sample liquid.
- 18 3. A device of Claim 1 wherein said capillary stop is a hydrophilic stop.
- 20 4. A device of Claim 1 wherein said capillary stop is a hydrophobic stop.
- 22 5. A device of Claim 1 further comprising at least one second reagent well in
liquid communication through a capillary passageway with said first reagent well.
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- 26 6. A device of Claim 5 further comprising at least one third reagent well in
liquid communication through a capillary passageway with at least one of said second
reagent wells of Claim 5.
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- 30 7. A device of Claim 1 wherein said first reagent well contains a reagent
adapted to react with a component contained in said uniform liquid sample.
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- 34 8. A device of Claim 7 wherein said first reagent well contains a reagent
adapted to react with a component contained in said uniform liquid sample and thereby
produce a response indicating the amount of said component in said liquid sample.

9. A device of Claim 7 wherein said first reagent well contains a reagent
2 adapted to react with a component contained in said uniform liquid sample and thereby
reduce interference of said component with a second component to be detected.

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10. A device of Claim 7 wherein said first reagent well contains a reagent
6 adapted to pretreat said liquid sample.

8 11. A device of Claim 8 wherein said first reagent well contains a reagent
adapted to react with a component in said liquid sample and thereby produce a reacted
10 component.

12 12. A device of Claim 11 wherein said reacted component is further reacted
in a second reagent well to produce a response indicating the amount of said component
14 in said liquid sample.

16 13. A device of Claim 2 wherein the walls of said capillary passageway of (b)
have a hydrophilic surface adjusted to provide substantially complete removal of said
18 liquid sample.

20 14. A device of Claim 5 wherein capillary passageways communicating
between said first and second reagent wells have walls hydrophobic to said sample fluid.

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24 15. A device of Claim 14 wherein the walls of said capillary passageways
have a hydrophobic surface adjusted to prevent deposits from adhering to said walls.

26 16. A device of Claim 1 further comprising electrodes disposed in said first
reagent well for measuring properties of said sample fluid.

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30 17. A device of Claim 5 further comprising electrodes disposed in at least one
of said second reagent wells for measuring properties of said sample fluid.

32 18. A device of Claim 6 further comprising electrodes disposed in at least one
of said third reagent wells for measuring properties of said sample fluid.

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19. A device for analyzing biological fluid samples comprising:

- 2 (a) a sample well for receiving a portion of said sample fluid and at least a
4 second well in fluid communication with said sample well;
6 (b) a capillary passageway connecting said sample well and said at least second
well, said capillary adapted to prevent said sample fluid from passing from said sample
well to said at least second well;

8 20. A device of Claim 19, wherein said capillary passageway has walls
10 sufficiently hydrophobic relative to said fluid sample that said sample cannot enter said
passageway until a force is applied capable of overcoming the opposing force created by
the surface tension of said sample fluid.

12 21. A device of Claim 19, wherein said capillary passageway has walls
14 sufficiently hydrophilic relative to said fluid sample so that said fluid sample can flow by
capillary forces into said at least second well and flow of said sample liquid is prevented
16 by a hydrophilic capillary stop until a force is applied capable of overcoming the
opposing force provided by said hydrophilic stop.

18 22. A device of Claim 20, wherein said capillary passageway has walls
20 having a hydrophobic surface adjusted to prevent deposits from adhering to said walls.

22 23. A device of Claim 21, wherein said capillary passageway has walls
having a hydrophilic surface adjusted to provide a substantially complete passage of said
24 sample fluid.

26 24. A device of Claim 19, wherein said capillary passageway has a width of
about 10 - 500 μm .

28 25. A device of Claim 24, wherein said capillary passageway has a depth of at
30 least 5 μm .

32 26. A multi-purpose device for analyzing a biological fluid sample
comprising:

- 2 (a) at least one sample well for receiving said sample;
- 2 (b) a capillary passageway communicating with at least one of said sample wells
of (a) for receiving said sample from said sample well by capillary action, said
4 passageway including a segment defining a uniform volume of said sample fluid, said
segment being disposed between two intersecting passageways vented to the atmosphere,
6 said segment communicating through a transfer capillary passageway to a first reagent
well for transferring said uniform sample from said segment to said first reagent well;
- 8 (c) a capillary stop disposed within said transfer passageway for preventing
transfer of said uniform sample to said first reagent well;
- 10 (d) optionally at least one second reagent well in fluid communication through a
capillary passageway with said first reagent well;
- 12 (e) optionally at least one third reagent well in fluid communication through a
capillary passageway with at least one of said second reagent wells.
- 14 (f) optionally at least one additional well for receiving portions of said sample of
(a);
- 16 (g) sufficient vent channels for venting to atmosphere the reagent wells of (b),
(d), (e) and (f) and wherein said reagent wells of (b), (d) and (e), said vent channels, and
18 said capillary stop of (c) are positioned on a flat disc so that capillary passageways may
be formed in said disc connecting said wells to each other and to said vent channels as
20 needed for analyzing said biological fluid sample.

22 27. A multi-purpose device of Claim 26, wherein said sample well of (a) is in
fluid communication with one of said additional wells of (f) and said additional well of
24 (f) is in venting communication with one of said vent channels of (g) and in fluid
communication with at least one of said reagent wells of (b), (d) and (e) said at least one
26 reagent well of (b), (d) and (e) being in venting communication with one of said vent
channels of (g).

28 28. A multi-purpose device of Claim 26, wherein at least one of said second
30 reagent wells of (d) is in fluid communication with said first reagent well of (b) and said
at least one of said reagent wells of (d) is in venting communication with a second of
32 said venting channels of (g).

29. A multi-purpose device of claim 28, wherein said at least one of said
2 second reagent wells of (d) is in fluid communication with at least one of said reagent
wells of (e) and said third additional well of (e) is in venting communication with a
4 venting channel of (g).

6 30. A multi-purpose device of Claim 26, wherein one or more of said reagent
wells of (b), (e) and (f) contain reagents for treating said sample.

8 31. A multi-purpose device of Claim 26, wherein said capillary stop is a
10 hydrophilic stop.

12 32. A multi-purpose device of Claim 26, wherein said capillary stop is a
hydrophobic stop.

14 33. A multi-purpose device of Claim 26, wherein said capillary segment of
16 (b) has walls with a surface hydrophilic to said sample.

18 34. A multi-purpose device of Claim 26, wherein said transfer passageway of
20 (b) and said passageways of (d) and (e) have walls with a surface hydrophobic to said
sample.

22 35. A multi-purpose device of Claim 33, wherein said capillary segment of
24 (b) has hydrophilic walls adjusted to provide a substantially complete passage of said
sample.

26 36. A multi-purpose device of Claim 34, wherein said passageways of (b), (d)
and (e) have hydrophobic walls adjusted to prevent deposits from adhering to said walls.

28 37. A multi-purpose device of Claim 26, wherein said capillary passageways
30 have a width of about 10 - 500 μm and a depth of at least 5 μm .